Abstract

Instruments for thermally-mediated treatment of a patient's lower esophageal sphincter (LES) to induce an injury healing response to thereby populate the extracellular compartment of walls of the LES with collagen matrices to altere the biomechanics of the LES to provide an increased intra-esophageal pressure for preventing acid reflux. A preferred embodiment is a bougie-type device for trans-esophageal introduction that carries conductive electrodes for delivering Rf energy to walls of the LES (i) to induce the injury healing response or (ii) to "model" collagenous tissues of the LES by shrinking collagen fibers therein. Typically, an Rf source is connected to at least one conductive electrode that may be operated in a mono-polar or bi-polar fashion. A sensor array of individual sensors is provided in the working end. A computer controller is provided, which together with feedback circuitry, is capable of full process monitoring and control of: (i) power delivery; (ii) parameters of a selected therapeutic cycle, (iii) mono-polar or bi-polar energy delivery, and (iv) multiplexing of current flow between various paired electrodes. The controller can determine when the treatment is completed based on time, temperature, tissue impedance or any combination thereof.